EVlink

Electric vehicle charging solutions

Catalogue

09.2013

EVlink charging solutions: giving

Health

No emission of fine particulates harmful to health

Air

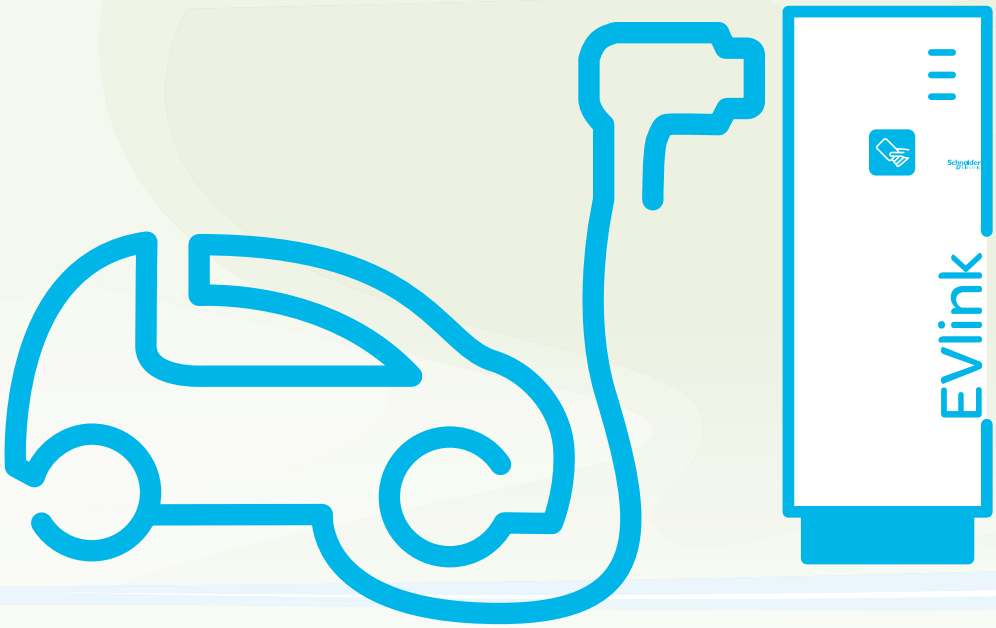
About 50% of the CO_2 compared with a conventional vehicle*

Smart grid

Boosts the expansion of smart grids

Eco-responsibility

An eco-responsible solution for everyday travel



* "From the well to the wheel - European mix" evaluation – Source: EDF 2010

energy to the future

" The creation of a reliable, efficient network of charging stations will greatly boost the development of electric vehicles "

Schneider Electric is a partner of the SAVE and ISSYGRID charging network projects and other international projects.

Our partners have chosen to equip their branches with EVlink stations

A founding member of the EV Plug Alliance, Schneider Electric is campaigning for the rapid adoption of charging infrastructure standards in order to ensure user safety.

This label guarantees that charging facilities are of the highest safety level, economical and in compliance with the latest IEC standards in force.

Electric vehicle charging solutions

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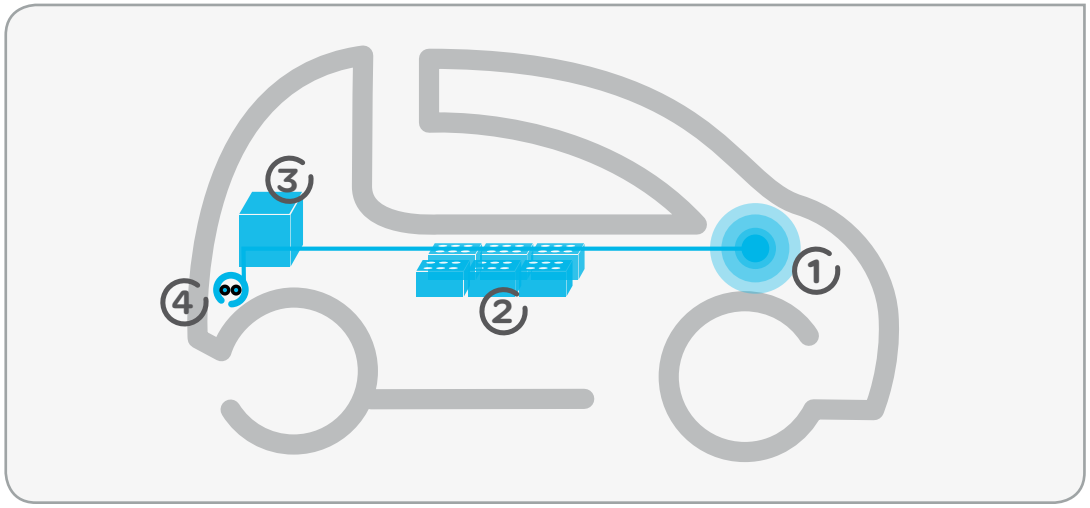
Discovery

The electric vehicle

4 major items:



① The motor

One or more motors equip the vehicle. Depending on size and performance, the total capacity ranges between 15 and 200 kW.

Example: 48 kW (65 hp) for a small 4-seater saloon.

② The battery set

It provides the energy necessary for the motor to operate. Charging takes place either during deceleration of the vehicle (motor in generator mode) or upon connection to a charging station.

The capacity of the batteries is approximately 5 to 40 kWh, at a voltage of 300 to 500 V.

Battery and touring range

The vehicle's touring range depends on battery capacity but also the driving style, the route configuration and the use of accessories (headlights, heating, etc.).

③ The charger

The charger converts the alternating current from the station into direct current and limits the inrush current to the maximum acceptable by the cable+station combination.

④ The charging connector

The vehicle is equipped with one or two connectors by the manufacturer depending on the type of charging wanted:

> at least one connector for "normal" or "accelerated" charging on the "AC" network;

> possibly a second connector for charging at a fast charging station.

Focus on technology

The batteries

Battery technology has made very significant progress in recent years.

Lead has gradually been discarded for other more efficient compounds.

Research is continuing with a view to improving capacity and reducing weight and heating during power inrush.

The technology most commonly used at present is lithium-ion.

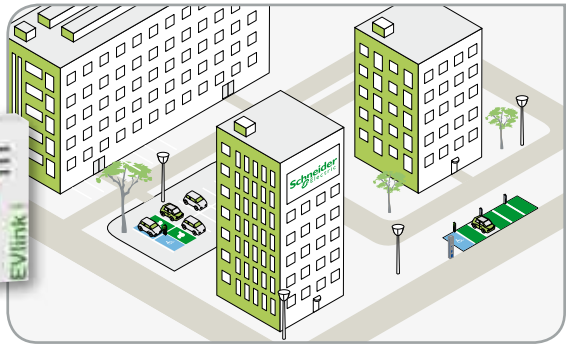
These new batteries have no memory effect and can therefore be charged without having to wait for them to be completely discharged.

They can be found in telephones, laptop computers and certain aircraft, but also in electric cars.

Where to charge

At home

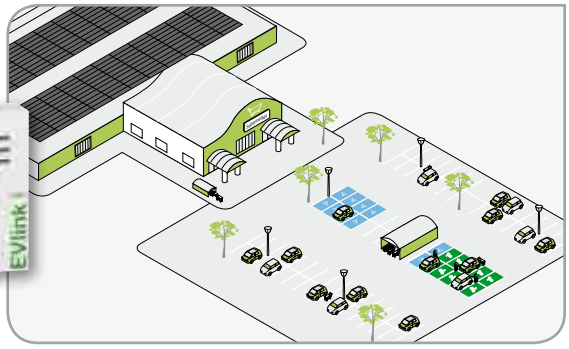
A station dedicated to domestic use has been installed. It alone can combine optimal safety conditions with speed of charging.



At work

Some companies develop an eco-responsible image and install stations on their parking lot. Charging is offered to personnel and customers on preferential conditions.

Municipal fleets, and the fleets of delivery services and government departments generally have parking lots fully equipped for charging their electric vehicles.

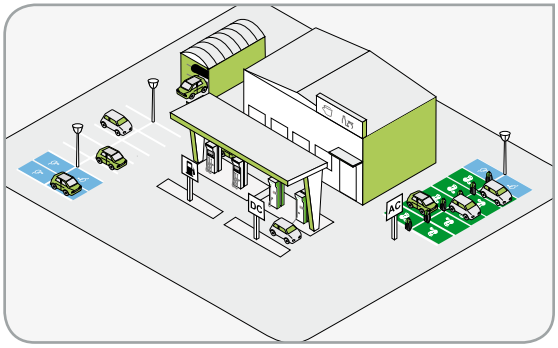


On a secure parking lot

Aware of new customer expectations, supermarkets frequently propose charging stations on their parking lots.

They can generally be accessed with a badge, based on various commercial conditions.

Municipalities and car park managers are now developing these services.



In the station

Service stations equipped for fast charging are appearing at test locations in some countries. The 30 minutes of charging required are used to have a break or do some shopping in the supermarket.

Charging

> The charging mode determines
the safety level

Low — Acceptable — High

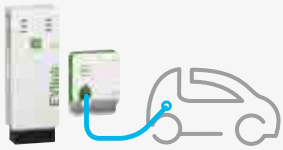
Mode 1

Direct connection
of the vehicle to the grid
> **Non-dedicated** power socket (domestic socket)
> **Simple** cable
> Risk of overheating, prohibited in the United States.

Mode 2

Direct connection
of the vehicle to the grid
> **Non-dedicated** power socket
> Cable with communicating charge monitoring device.

Mode 3

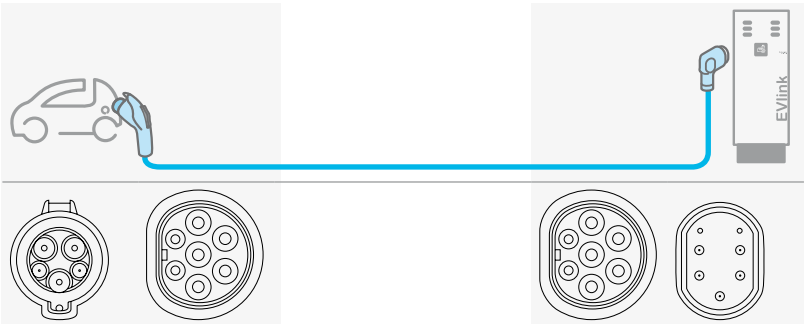


Direct connection
of the vehicle to the grid
> **Dedicated power socket** incorporating charge monitoring
> Dedicated cable.

Mode 4

Indirect connection
of the vehicle to the grid, via an external charger
> Direct-current external charger incorporating charge monitoring
> Dedicated cable.

> The type of charging connector determines
the maximum permissible charging capacity (1)



Manufacturers' data (2)	Type 1	Type 2	Type 2	Type 3
Max. power (single-phase)	3 kW	7 kW		
Max. power (three-phase)	22 kW			
Max. current	32 A			

(1) Subject to a suitable cable cross section.
(2) The IEC 62 19662 standard defines higher values in anticipation of technological development.

> The effective charging capacity
is that of the weakest "link", for example:

Vehicle charger	Cable / charging mode	Charging point	Effective charging capacity
7 kW	3 kW (mode 2)	Domestic power socket 2 kW	2 kW
7 kW	7 kW (mode 3)	11 kW	7 kW

The power of the means of charging determines the speed of charging*

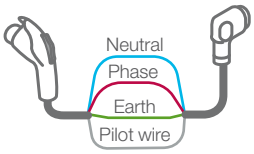
Example for a vehicle fitted with a 22 kWh battery and having a touring range of 150 km:

Means used	Domestic power socket	Dedicated AC power socket		Dedicated DC power socket
Power	Single-phase: 2 kW	Single-phas: 7 kW	Three-phase: 22 kW	Three-phase: 43 kW
Time to "fill up"	12 h	5 h	1h30 min	30 min
% of charge reached in 30 min	4%	10%	34%	100%

** Subject to the use of a suitable cable.*

Focus on technology

The charging cable

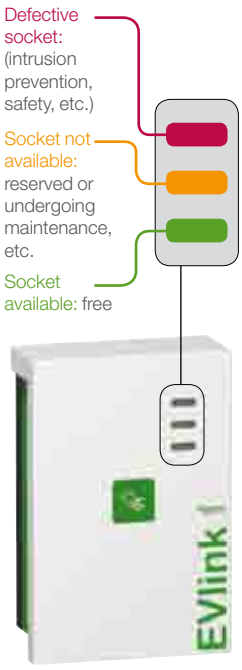


A "pilot" wire allows data interchange between the vehicle and the charging station. The latter will start charging only if the following information is present:

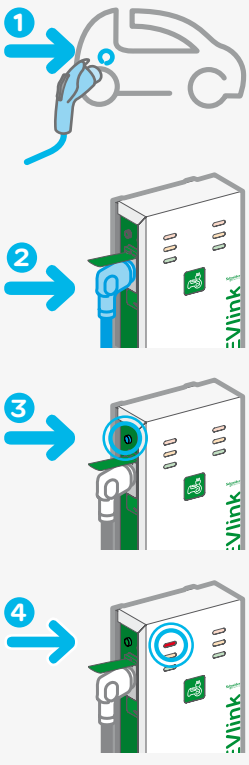
- vehicle connection OK
- vehicle earthing OK
- indication of the maximum power allowed by the charger.

Use of a station

Check the availability of the charging station


Defective socket: (intrusion prevention, safety, etc.)
Socket not available: reserved or undergoing maintenance, etc.
Socket available: free
EVlink

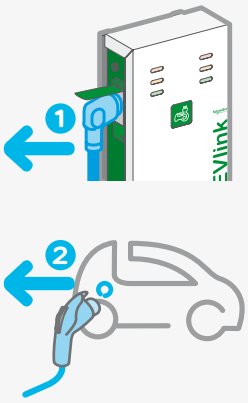
Plug in to the charging station



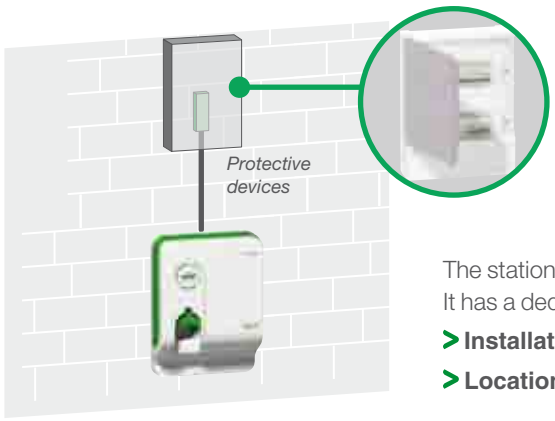
Check that the vehicle is fully charged

Charging can be stopped manually at any time

Disconnect from the charging station



Charging architectures



The station operates autonomously.
It has a dedicated protective device.

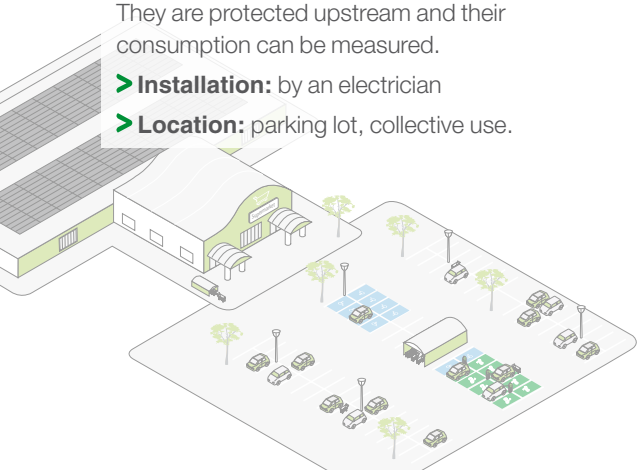
> **Installation:** by an electrician

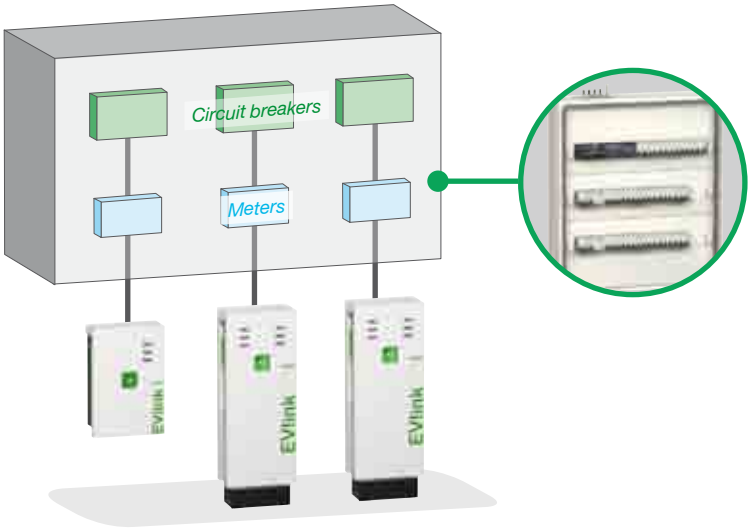
> **Location:** residential, personal use.

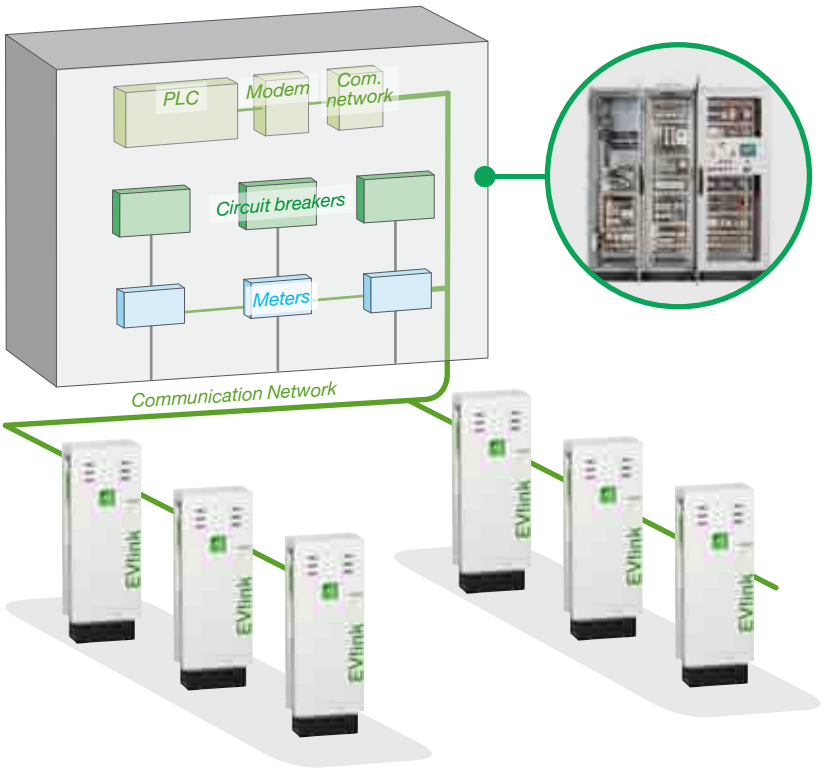
Each station operates independently.
They are protected upstream and their consumption can be measured.

> **Installation:** by an electrician

> **Location:** parking lot, collective use.



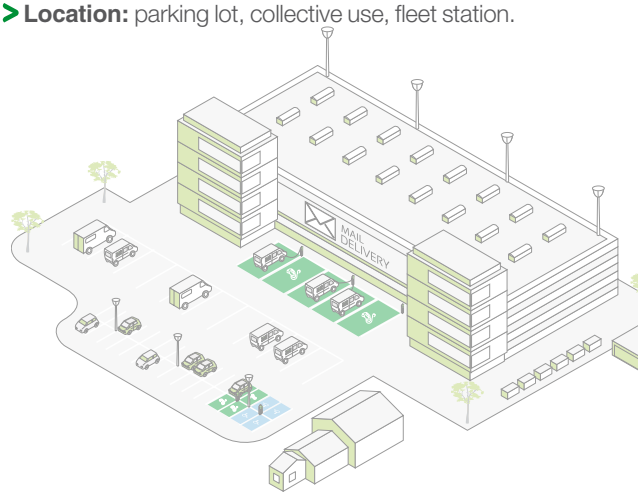




The stations are brought together in a set of stations. They are under the control of collective facilities which perform functions of energy management, supervision on web pages, etc. Each station is protected upstream.

> **Project:** Schneider Electric "turnkey" project to customer specifications

> **Location:** parking lot, collective use, fleet station.



The EVlink product range

Electric vehicle charging stations

Overview of EVlink solutions

Residential

page 16

Stations with or without attached cable

> Power range: 3 to 11 kW

> For single-phase and three-phase networks

> **Indoor installation**

> Wall mounting.

Parking

page 20

Free-access stations

> 1 or 2 integrated socket bases

> Power range: 7 or 22 kW per socket

> For single-phase or three-phase network

> **Indoor or outdoor installation**

> Stand or wall mounting.

To connect the car to the station

EVlink charging cable

Type 1 and 3 connectors – power 3 kW.

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Protection and monitoring panels for EVlink Parking stations

Standard architectures, turnkey or to be built to Schneider Electric specifications.

Based on protection, metering, automation and communication components.

Parking - RFID

page 20

Access stations with RFID badge monitoring (wireless, contactless)

> 1 or 2 integrated socket bases

> Power range: 7 or 22 kW per socket

> For single-phase or three-phase network

> **Indoor or outdoor installation**

> Floor or wall mounting.

Fast charging station

page 26

Stations with or without RFID badge monitoring (wireless, contactless)

> 1 or 2 attached cables

> Direct current power: 60 kW

> Alternating current power: 43 kW

> For three-phase network

> **Indoor or outdoor installation**

> Floor mounting.

Schneider Electric supports you throughout the project and during operation:

Design, implementation and maintenance service offers. Expert appraisals.

Software for monitoring panel PLC

> Management of a parking lot station set

> Energy management functional scenarios

> Management of data transfer for Supervision.

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Supervision

Administrative and technical management on web pages:

> stations in stations;

> fast charging stations.

Data file transfer.

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EVlink Residential

In short

Extensive choice

Range of 8 stations:

> Wall-mounted

> 3, 7 or 11 kW charging.

> Without attached cable: T3 connector

> With attached cable: T1 or T2 connector.

Cover structure

Mechanical strength, IK08

Indoor installation, IP41

Cable storage holder (delivered with stations with attached cable).

Supplement

Simplified operation: "Plug & charge".

Ready for the connection of energy management components:
off-peak hours contactor, load shedding device, etc.

Installation

By a single person: an accredited professional
He performs an audit of the home's electrical installation, which must be able to withstand without risk the power inrush during charging.

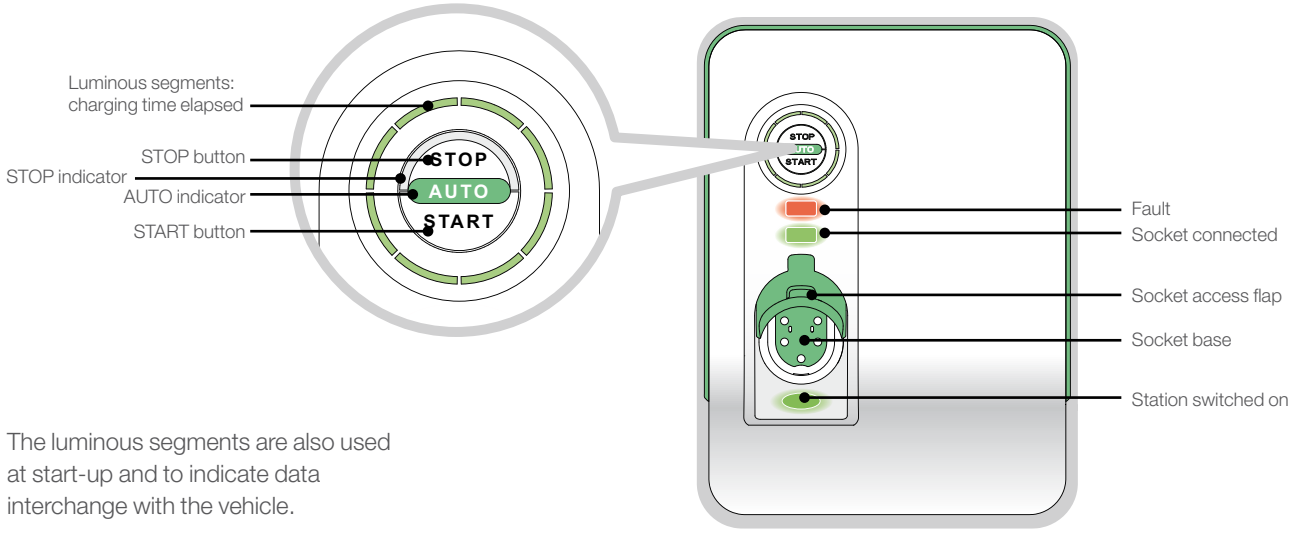
The electrical switchboard is arranged to receive the appropriate protective devices in accordance with electrical regulations.

Complete verification of correct operation using the test kit simulating the connection of a vehicle.

Application

EVlink Residential stations are designed to allow private persons to have a charging point dedicated to their electric vehicle: in their garage, integrated into the house or not.

Discovery



The luminous segments are also used at start-up and to indicate data interchange with the vehicle.

Functions

The "Deferred" and "Early" controls are available after adding an "off-peak hours" contactor or a time switch.

Load shedding requires a load shedding device.

These components are installed in the electrical switchboard and connected to the EVlink Residential station.

3 possible ways to start charging:

1. **Automatic:** immediate, after connection
2. **Deferred:** at defined times, upon information from an "off-peak hours" contact or a time switch
3. **Forced:** by pressing the "START" button, without waiting for deferred engagement.

3 possible ways to stop charging:

1. **Automatic:** when charging is completed
2. **Early:** at the end of off-peak hours or at the end of the time slot programmed in the time switch
3. **Forced:** by pressing the "STOP" button without waiting for automatic or early stoppage.

Load shedding

The load shedding device temporarily suspends charging to prevent tripping of the main circuit breaker during a heavy inrush current (use of an electric oven, for example).

EVlink Residential

Characteristics

Characteristics of the power supply network

> Frequency: 50 Hz or 60 Hz

> Earthing system: TT or TN

> Voltage required for the power circuit:
- 230 V AC 1P+N for 3 and 7 kW stations
- 400 V AC 3P+N for 11 kW stations

> Voltage required for the monitoring circuit: 230 V AC 1P+N.

Charging characteristics

> Charging mode: 3, as per IEC 61851

> Base or charging connectors as per IEC 62196:
- station without attached cable: base for T3 connector
- station with attached cable: T1 or T2 connector

> Communication between station and vehicle via charging cable as per IEC 61851.

Safety:

> Vehicle earthed during charging

> Charging current limiting according to the capacity of the weakest element of the charging system (vehicle, charging cable, charging station)

> Station switching to fault mode upon a charging cable or network problem.

Mechanical and environmental characteristics

> Material: polycarbonate

> Degree of protection (as per IEC 60529): IP41

> Degree of mechanical protection (as per IEC 62262): IK08.

Station type	Total weight	Dimensions (H x L x D)
Station without attached cable	2.5 kg	323 x 242 x 100 mm
Station with attached cable	5 kg	

Environment	
Working temperature	-25°C / +50°C
Storage temperature	-50°C / +80°C
Relative humidity rate (RH)	< 93%

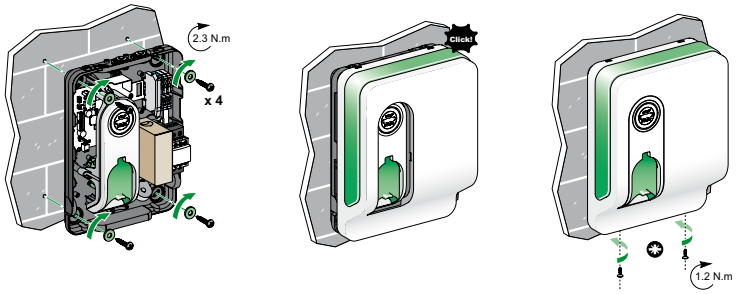
EVlink Residential allows the implementation of a "ZE Ready" installation subject to setup in accordance with Renault's instructions and performed by an accredited professional.

Certification

EVlink Residential has obtained the CB test certificate issued by the LCIE test laboratory, establishing compliance with the IEC 61851-1 and IEC 61851-22 standards.

Setup schematic

Surface mounting, arrival of the power supply duct at the bottom of the housing.



Commercial references

Residential stations

Marketing	Connector type	Power (kW)	Supplied with circuit breaker (1)	Ref.
Without cable				
France	T3	3	yes	**NCA11130**
		7	yes	**NCA11230**
International ex France	T3	3	no	**NCA19130**
		11	no	**NCA19330**
With cable, attached (2)				
International ex France	T1	3	no	**NCA11100**
		7	no	**NCA19200**
	T2	7	no	**NCA19210**
		11	no	**NCA19310**

(1) 30 mA residual current circuit breaker, rating according to station power.
(2) Cable holder included.

Charging cable

It allows the vehicle to be connected to the charging station.

> Power: 3 kW
> Connector type:
- vehicle end: T1 connector
- charging station end: T3 connector

> Length: 5 m
> Network: single-phase.

Reference: NCA01535

Electric vehicle simulator

It allows complete verification of satisfactory operation of the station and charging cable, in the field.

Reference: NCA93100

Cable holder

It allows the cable to be wound up for easy storage.
It is installed on the wall.

Reference: NCA00100

EVlink Parking

In short

Extensive choice

Range of 32 stations:

> Stand or wall mounting

> 7 kW or 22 kW charging

> T2 or T3 connector

> 1 or 2 connectors per station

> With or without RFID badge reader, for user identification.

Cover structure

Mechanical strength, IK10

Indoor and outdoor use

High IP level: IP54, charged and uncharged.

Supplement

Independent stations: Simplified automation

Grouped stations: common **energy management functionalities, supervision on web pages.**

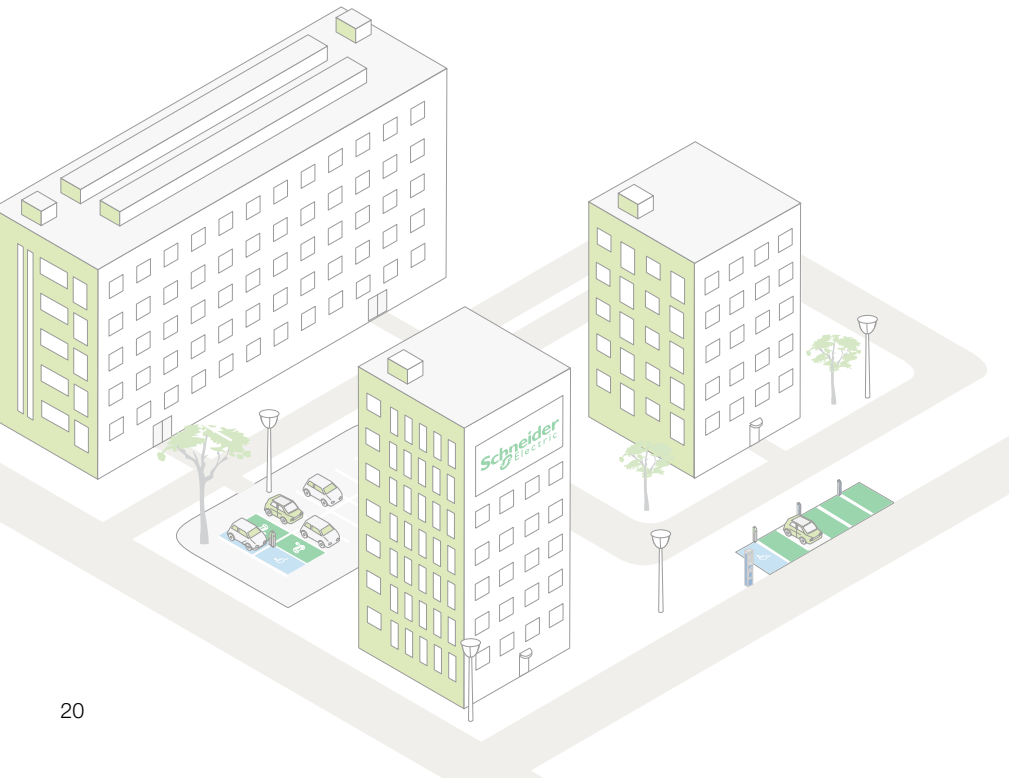
Installation

By a single person: an accredited EV professional

The station is delivered in three packages for easier handling and installation.

The electrical switchboard is adapted or created to ensure the optimal level of protection and monitoring on the stations.

Complete verification of correct operation using the test kit simulating the connection of a vehicle.



Application

The EVlink Parking station product range is designed to meet the requirements of secure parking lots (closed, with filtered access, or under surveillance):

- **Parking lots for vehicle fleets;**
- **Paid-access car parks;**
- **Shopping mall parking lots (under surveillance, with opening hours, etc.);**
- **etc.**

The stations can be installed **outdoors** or **indoors.**

Discovery

Independent stations

One or more stations can be connected to the same protection panel but operate completely independently via their own on-board control functions:

> Automatic charging safety controls

> RFID access control to charging (depending on version)

> etc.

The protection panel may be that of a building.

Grouped stations

Advanced control functions:

> "EVlink MS Energy" energy management

> "EVlink MS Supervision" operating supervision

are accessible when the stations are grouped.

They are then under the control of a programmable logic controller and network components: switch, GPRS modem, etc.

These components are brought together in a protection and monitoring panel dedicated to the set of stations.

A set consists of stand-mounted and/or wall-mounted stations and the total number of sockets may not exceed 16.

EVlink Parking

Characteristics

The appearance may be customized on request.

Please don't hesitate to contact your Schneider Electric correspondent to assist you in this project.

Characteristics of the power supply network

> Frequency: 50 Hz or 60 Hz

> Earthing system: TT or TN

> Power circuit voltage (provide for 1 input per charging point):
- 230 V AC 1P+N for 7 kW stations
- 400 V AC 3P+N for 22 kW stations

> Control circuit voltage (provide for a specific circuit): 230 V AC 1P+N.

Safety:

Each circuit must have upstream protection against overloads, short circuits and insulation faults.

Charging characteristics

> Charging mode: 3, as per IEC 61851

> Charging connector base:
- 1 or 2 connectors per station
- Type 2 or Type 3 as per IEC 62196, a single type per station
- protective flap, locked for RFID versions

> Communication between station and vehicle via charging cable as per IEC 61851.

Safety:

> Vehicle earthed during charging

> Charging current limiting according to the capacity of the weakest element of the charging system (vehicle, charging cable, charging station)

> Station switching to fault mode upon a station or charging cable or network problem.

RFID reader (depending on model)

> Access to the connector by unlocking the flap after wiping the badge in the reader

> Frequency of reading and writing: 13.56 MHz

> Compatible with badges to ISO 15693 and ISO 14443 A and B standards

> 10 badges supplied with each station equipped with a reader.

Mechanical and environmental characteristics

> Material: painted steel, with corrosion protection treatment on covers

> Degree of protection (as per IEC 60529): IP54 (charged and uncharged)

> Degree of mechanical protection (as per IEC 62262): IK10.

Station type	Total weight	Dimensions (H x L x D)
Stand-mounted station	43.5 kg	1 425 x 330 x 200 mm
Wall-mounted station	25.7 kg	460 x 330 x 165 mm

Environment	
Working temperature	-25°C / +50°C
Storage temperature	-40°C / +80°C
Relative humidity rate (RH)	< 95%
Maximum altitude	2 000 m

Certification

EVlink Parking has obtained the CB test certificate issued by the LCIE test laboratory, establishing compliance with the IEC 61851-1 and IEC 61851-22 standards.

EVlink Parking allows the implementation of a "ZE Ready" installation subject to setup in accordance with Renault's instructions and performed by an accredited professional.

Commercial references

Stand-mounted stations

Station type	No. of connectors	Connector type	Power	
			7 kW	22 kW
Without RFID reader				
	1	T2	EVF1S7P02	EVF1S22P02
		T3	EVF1S7P03	EVF1S22P03
	2	T2	EVF1S7P22	EVF1S22P22
		T3	EVF1S7P33	EVF1S22P33
With RFID reader				
	1	T2	EVF1S7P02R	EVF1S22P02R
		T3	EVF1S7P03R	EVF1S22P03R
	2	T2	EVF1S7P22R	EVF1S22P22R
		T3	EVF1S7P33R	EVF1S22P33R

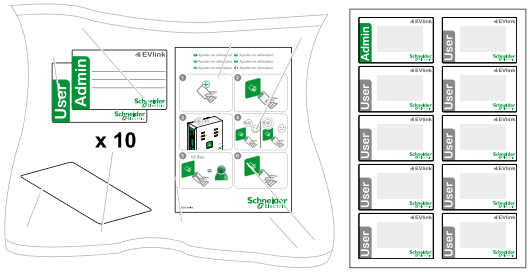
Wall-mounted stations

Station type	No. of connectors	Connector type	Power	
			7 kW	22 kW
Without RFID reader				
	1	T2	EVW1S7P02	EVW1S22P02
		T3	EVW1S7P03	EVW1S22P03
	2	T2	EVW1S7P22	EVW1S22P22
		T3	EVW1S7P33	EVW1S22P33
With RFID reader				
	1	T2	EVW1S7P02R	EVW1S22P02R
		T3	EVW1S7P03R	EVW1S22P03R
	2	T2	EVW1S7P22R	EVW1S22P22R
		T3	EVW1S7P33R	EVW1S22P33R

EVlink Parking

Commercial references

Pack of 10 RFID badges

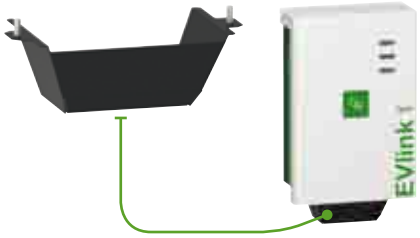


For stations equipped with a RFID reader.
The badges are supplied blank, ready to be programmed to identify an administrator or user.

Sheet of labels to be stuck on the badges:
1 administrator + 9 users.

Reference: EVP1BNS

Incoming cable protective cover



For wall-mounted stations.

It locks user access to incoming cables.

Degree of protection: IK10

Reference: EVP1WPSC

Cable holder

For stand-mounted and wall-mounted EVlink Parking stations.

It allows the cable to be wound up for easy storage.

Reference: EVP1PH

Charging cable

It allows the vehicle to be connected to the charging station.

Power:	3 kW
Connector type:	Vehicle end: T1 connector Charging station end: T3 connector
Length:	5 m
Network:	Single-phase

Reference: NCA01535

Electric vehicle simulator

It allows complete verification of satisfactory operation of the station and charging cable, in the field.

Reference: NCA93100

Specific components for protection and monitoring panel ("turnkey" projects)

Software on SD card for Modicon M340 PLC.

EVlink MS Energy & Cluster Management Software
Reference: NCA82000

EVlink MS Cluster Management Software
Reference: NCA84000

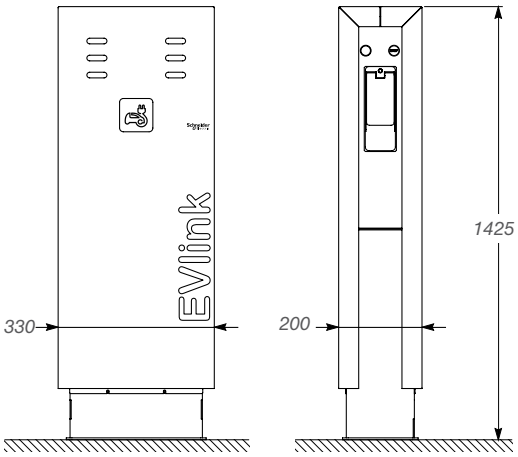
Wireless–internet communication interface, supplied with its accessories.

EVlink MS Supervision GPRS modem
Reference: NCA91000

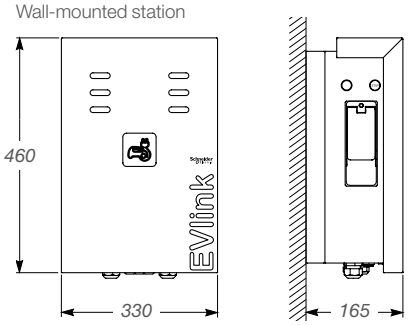
Practical information

Dimensions (mm)

Stand-mounted station

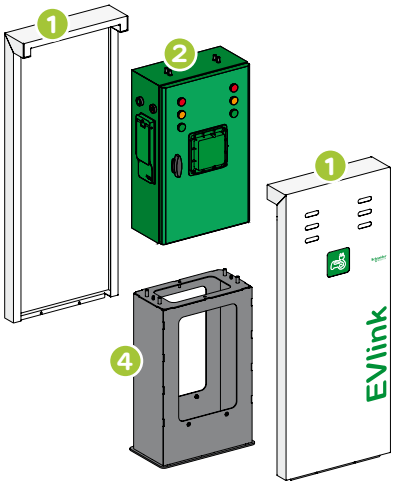


Wall-mounted station

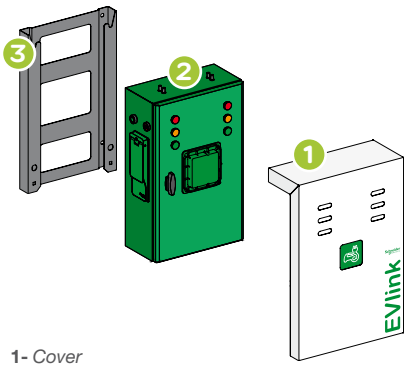


Composition

Stand-mounted station



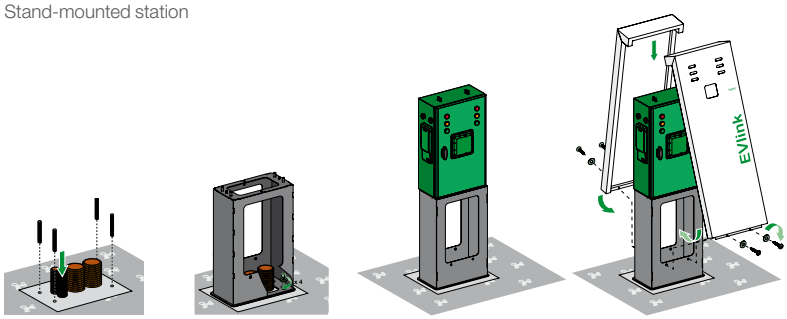
Wall-mounted station



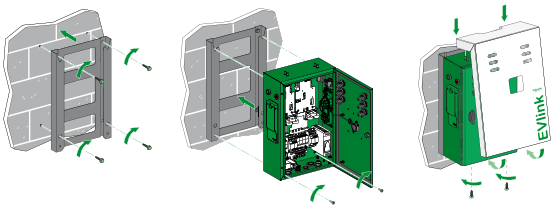
1- *Cover*
2- *Cubicle*
3- *Wall-mounted holder*
4- *Stand*

Setup schematic

Stand-mounted station



Wall-mounted station



EVlink Fast Charge

In short

The choice

Range of eight fast charging stations

> Standard or with additional equipment

> 500 V direct current and/or 400 V alternating current.

Cover structure

Mechanical strength, IK10

Indoor and outdoor use

High IP level: IP54, charged and uncharged.

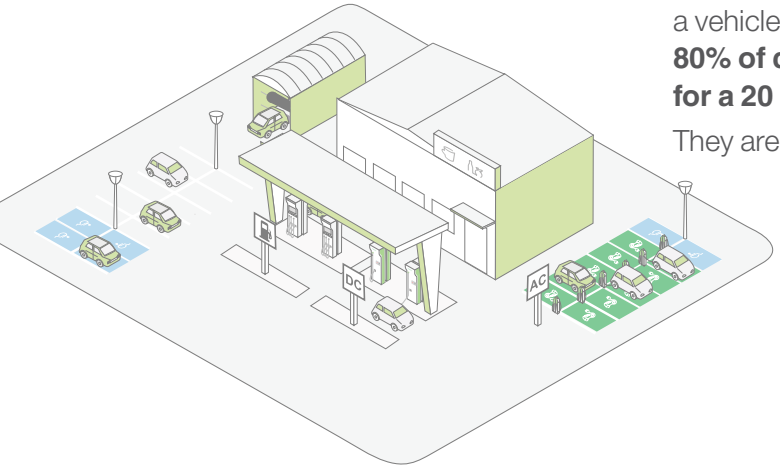
Installation

The stations are designed for facilities such as service stations and parking lots for business vehicle fleets.

A **feasibility study** must be carried out to assess the facility's ability to provide the necessary power, identify electrical duct routing, etc.

A **protection and monitoring panel** is arranged in an existing panel or created to ensure the optimal level of protection and monitoring for the station.

Application



EVlink Fast Charge stations are designed to charge a vehicle rapidly:
80% of capacity charged in 30 minutes, for a 20 kWh battery.

They are intended for service stations in particular.

Characteristics

Mechanical and environmental characteristics

> Degree of protection (as per IEC 60529): IP54

> Station dimensions (H x L x D): 2080 x 1070 x 662 mm

> Working temperature: -30°C / +50°C

> Weight: approx. 700 kg.

Characteristics of the range

Direct current station

> Charging in mode 4

> CHadeMO type connector

> Charging voltage/current: 500 V DC / 120 A

> Power supply: 400 V AC (+10/-15%) – 80 A – 3 Ph – 50-60 Hz

> Electrical protective devices integrated into the station.

Direct current + alternating current station

> Charging in mode 4 and mode 3

> Direct current charging:
- CHadeMO type connector
- charging voltage/current: 500 V AC / 120 A

> Alternating current charging:
- Type 2 connector
- charging voltage/current: 400 V AC / 63 A

> Electrical protective devices integrated into the station.

Cable length: 3 m

Additional functionalities available

> Strengthened screen

> Subscriber badge reading.

User dialogue and data

> 5.7' backlit touch-sensitive LCD screen for display of the residual charge and to enter the charge set point value (duration, number of kWh, euros)

> Charge management
- charge according to the amount in euros, charging time or kWh requested
- connector locking during charging

> Data supplied on Ethernet port

> Data transmission
Operating data, status, activation/deactivation of the station, etc.

Commercial references

Charging stations	500 V DC	500 V DC + 400 V AC
Fast charging stations		
Standard	*Please contact us*	
Stations with special equipment		
Strengthened screen	*Please contact us*	
RFID badge reader		
Strengthened screen + RFID badge reader		

Electric vehicle simulator

In short

Tool of the accredited professional

To check **correct operation** of a station

> EVlink Residential

> EVlink Parking

> Any charging station complying with IEC 61851-1, by simulation of a vehicle during charging.

"All-terrain" use

Mechanical strength

> IK strength: IK8

> Resists falls of up to 1 m

Indoor and outdoor use

> IP54: closed kit

> IP44: open kit

Easily transportable

> Weight: 6 kg.

Compatibility

Accepts any cable fitted with a **T1 or T2 connector**

Single-phase or three-phase alternating current charging.

In complete simplicity...

Simulator connected, charging started by pressing a button, the result is visible on an indicator lamp. **A few minutes** to check correct operation of a station.

... and full independence

Power supply via the charging cable

No internal battery, **the length of servicing operations is not limited.**

Application

The simulator can be used to start the station charging process without an electric vehicle and with a current < 1 A.
The tests are valid on EVlink stations and all those operating in mode 3 or simplified mode 3 complying with the IEC 61851-1 standard.

> Test on the electrical installation and wiring upstream of the station (detection of absence of neutral or phase-neutral inversion).

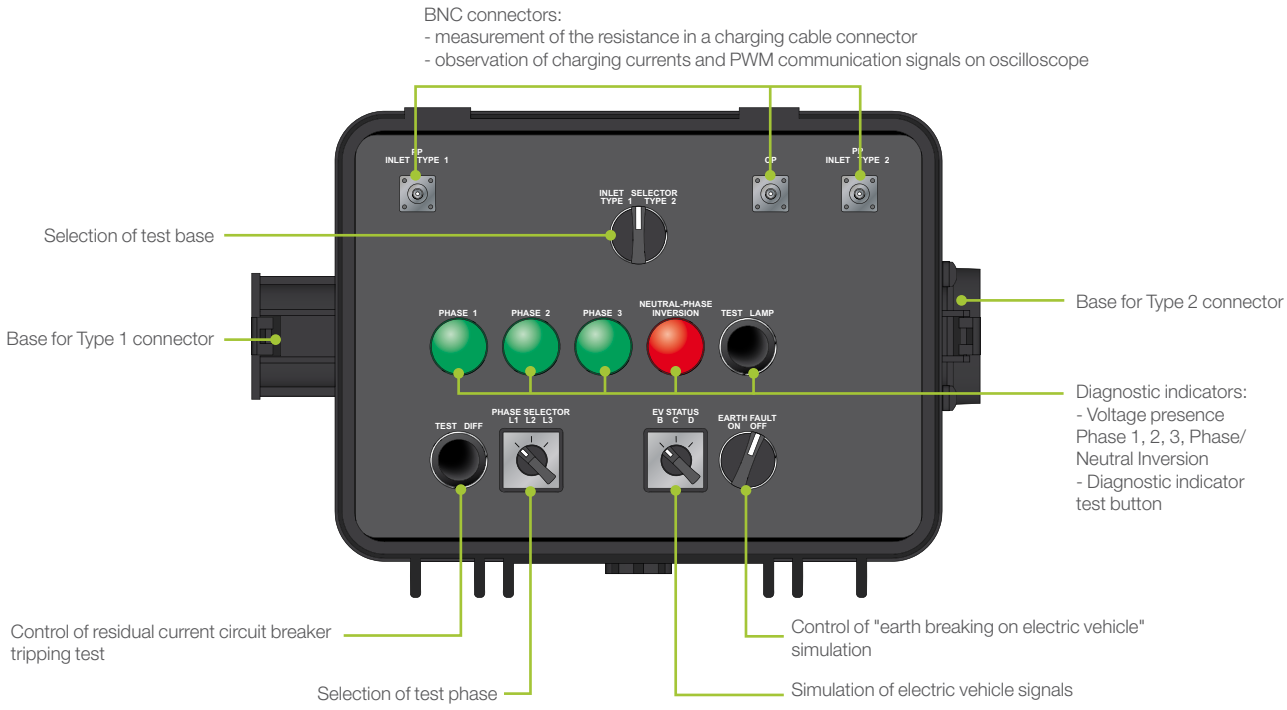
> Test on tripping of the residual current circuit breaker for each station phase.

> Check on the strength of the customer's charging cable connector.

> Check on the charging-cable pilot wire and check on the station by simulation of the various standardized statuses of an electric vehicle.

> Test on the station contactor upon the triggering of charging by communication signals.

Discovery


BNC connectors:
- measurement of the resistance in a charging cable connector
- observation of charging currents and PWM communication signals on oscilloscope
Selection of test base
Base for Type 1 connector
Base for Type 2 connector
Diagnostic indicators:
- Voltage presence Phase 1, 2, 3, Phase/ Neutral Inversion
- Diagnostic indicator test button
Control of residual current circuit breaker tripping test
Selection of test phase
Control of "earth breaking on electric vehicle" simulation
Simulation of electric vehicle signals
INLET TYPE 1
CP
INLET TYPE 2
INLET TYPE 1 SELECTOR TYPE 2
PHASE 1
PHASE 2
PHASE 3
NEUTRAL-PHASE INVERSION
TEST LAMP
TEST DIFF
PHASE SELECTOR L1 L2 L3
EV STATUS B C D
EARTH FAULT ON OFF

Safety during the tests

> The signals generated by the simulator comply with the IEC 61851 standard.

> Vehicle simulator earthing.

> Load current in the simulator limited to the minimum value allowing complete validity of the tests.

> Station switching to secure mode in the event of problems on the upstream network or the charging cable.

Electric vehicle simulator

Characteristics

Electric vehicle simulator

It allows complete verification of satisfactory operation of the station and charging cable, in the field.

Reference: NCA93100

Charging cable

It allows the simulator or the vehicle to be connected to the charging station.

> Power: 3 kW
> Connector type:
- vehicle end: T1 connector
- charging station end: T3 connector

> Length: 5 m
> Network: single-phase

Reference: NCA01535

Characteristics of the power supply network

> The simulator is powered via the charging current
> Network frequency: 50 Hz or 60 Hz
> Earthing system: TT or TN (do not use in IT)
> Voltages:
- 230 V AC on type 1 connector
- 400 V AC on type 2 connector

> Charging current during test < 1 A.

Mechanical and environmental characteristics

> Degree of protection (as per IEC 60529):
- closed kit: IP54
- open kit: IP44

> Degree of mechanical protection (as per IEC 62262): IK8
> Dimensions (H x L x D): 270 x 305 x 170 mm
> Weight: 6 kg
> Left-hand base:
Type 1 inlet • IEC 62196 type 1 • U: 230V1 • I: < 1 A • F: 50-60 Hz
> Right-hand base:
Type 2 inlet • IEC 62196 type 2-II • U: 400V3~ • I: < 1 A • F: 50-60 Hz
> Storage temperature: -30°C / +50°C
> Working temperature: -30°C / +50°C
> Risk of damage to the simulator in the event of dropping at a temperature < -2°C
> Relative humidity rate (RH): < 95%.

Accessories and documentation included

> Plasticized User's Manual attached under the cover
> Detailed User Guide
> BNC/banana plug adapter cord.

Certification

> The electric vehicle simulator complies with the IEC 61010-1 and IEC 61851-1 standards.

Recommended measuring instruments for additional tests

> **Ohmmeter:** to measure the resistance in the customer's cable connector.
> **Oscilloscope:** for observation of signals during the electric vehicle status simulation test (signals in accordance with the IEC 61851 standard).

Managing the energy of a charging station

EVlink MS Energy Management
(system for protection and monitoring panel)

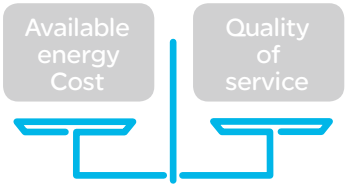
Energy management issues

What is energy management?

Energy management involves constantly optimizing the quality of service rendered by electrical equipment according to the criteria of:

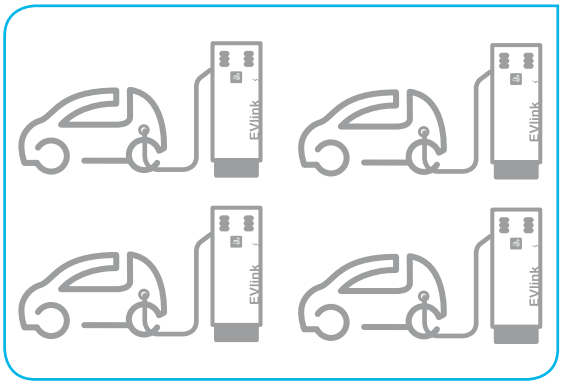
> continuity of service, taking into account the maximum capacity of the energy source;

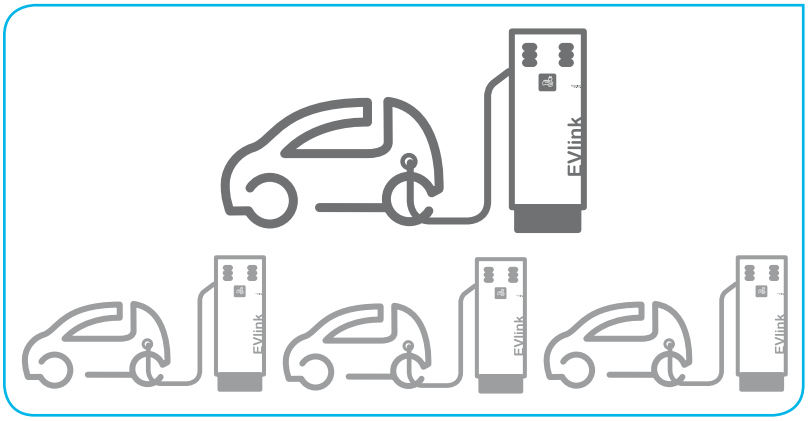
> operating cost, taking into account the price structure of the supplier.



And for a charging station, in particular?

Allowing **simultaneous charging** of the largest number of vehicles, as quickly as possible...



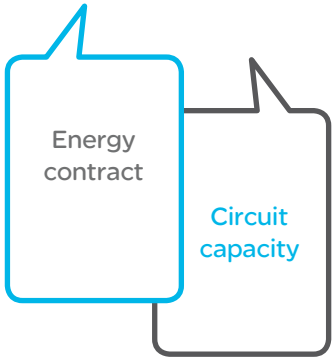


... while maintaining **charging priority privileges**, if necessary.

What are the main means of management?

A parameter

The **"subscribed demand"** with the energy supplier, or the maximum capacity of the power supply circuit (depending on the cross section of cables, the rating of circuit breakers, etc.).

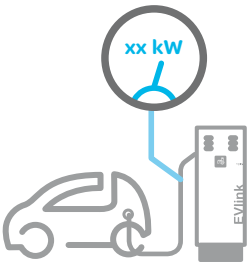


A measurement

The total power demand.

A monitoring actuator

The station that can execute an order temporarily limit the current supplied to the vehicle.



In other words, energy management:

Avoids disrupting the station, causing operating losses

When a large number of devices in the facility and the station are operating simultaneously, the total current is limited and does not risk causing opening of the main circuit breaker.

Reduce energy and electrical infrastructure costs

The contract is subscribed to for a capacity less than that of the total loads.

The power demand is limited and does not risk leading to overrun penalties or extra costs to bolster the facility's power supply and distribution network.

Increases driver satisfaction

Each station always supplies the maximum available energy. Valid on all the station's stations, VIP badges provide charging priority advantages for delivery services, sales reps, customers, etc.

Makes operations more efficient

Each connector is defined with a maximum power, to allow for its use and location.

The list of authorized badges is centralized to save time for updates.

Station powered by the network of a facility

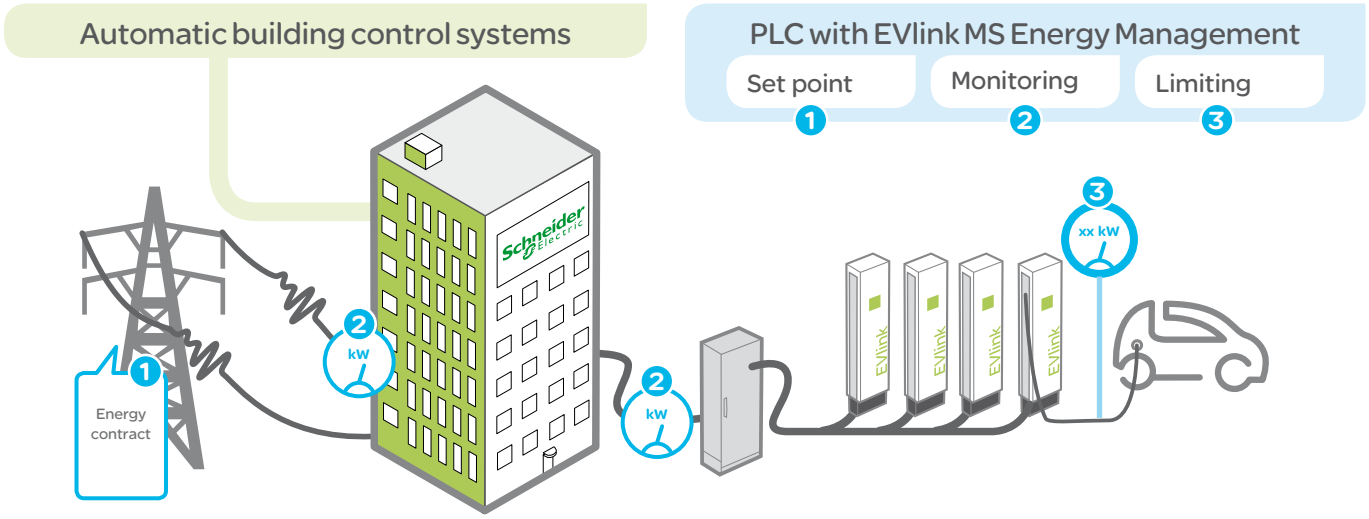
This is the case for charging stations whose administrative and technical management are grouped together with that of a firm. An example is a firm managing a fleet of vehicles.

Overall energy management (facility + station) is recommended in particular when the maximum power of the station (simultaneous use of all connectors at full power) is very large by comparison with that of the facility.

Building automation and EVlink MS Energy Management, complementary systems

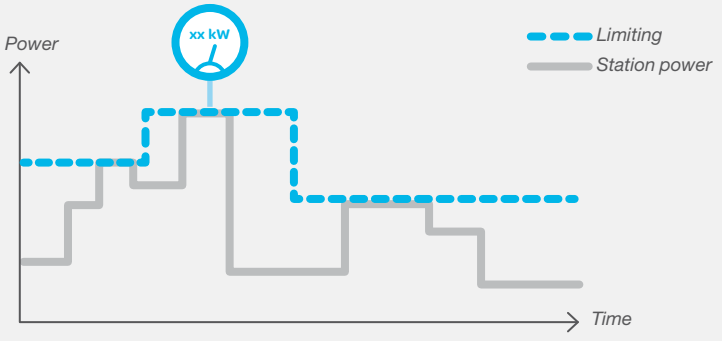
In buildings, automatic control systems supervise total consumption and adapt the operation of certain devices to optimize consumption and consumption costs without adversely affecting work efficiency and comfort.

The total consumption and that of the station are constantly transmitted to the station's PLC. When this value approaches the limit set by the energy contract, the EVlink MS Energy Management program sends the stations an order temporarily limiting charging. Accordingly, the power demand from the stations is that actually available.

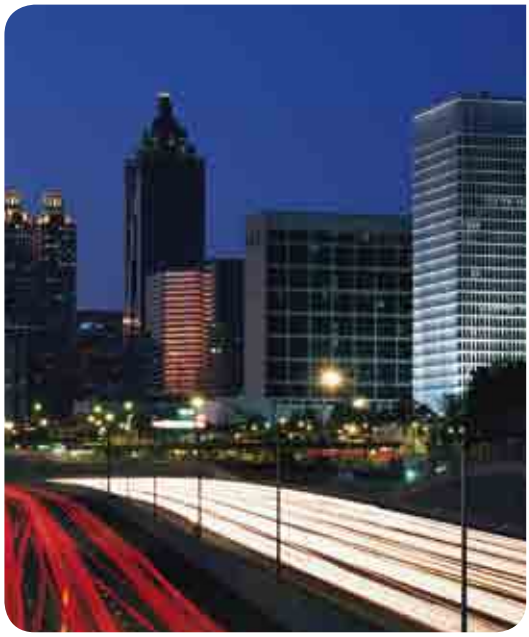


Power monitoring

"Dynamic power allocation":
The EVlink MS Energy Management maximum power set point is updated constantly.



Station powered by the public grid



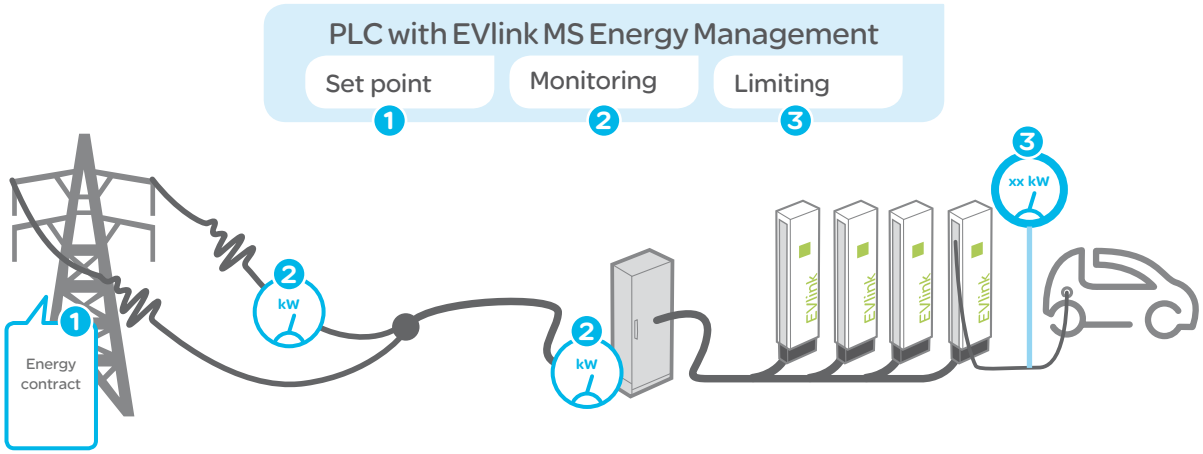
The charging station's energy is supplied directly by the electricity distribution system. The installation includes an energy counter and a circuit breaker set to the subscribed demand.

This case generally applies to parking lot station stations for which the manager is independent. Energy management is systematically recommended to optimize capital costs and energy supply subscription costs.

EVlink MS Energy Management, for compliance with the energy contract

In the protection and control panel, the EVlink MS Energy Management program loaded in the PLC ensures energy management.

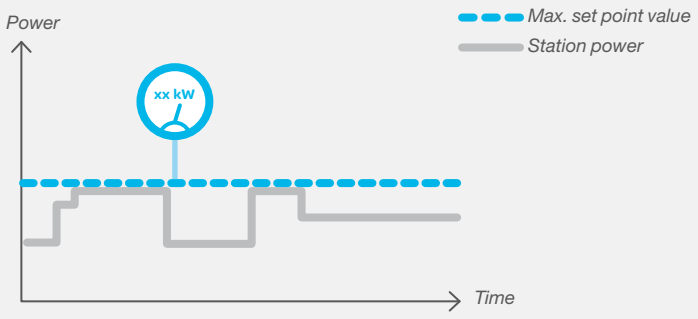
The maximum power set point parameter is entered at start-up, together with the station power limiting scenario (see description on next page). The PLC constantly monitors the station's total power. Based on this information, and if necessary, it can at any time activate or cancel station power limiting.



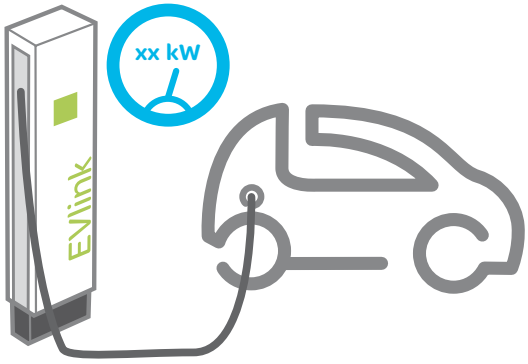
Power monitoring

With **"Static power allocation"** the maximum power set point value is equal to the subscribed demand.

This mode can also be adopted when the station is powered by a building. In that case the set point depends on the electrical sizing of the station's power supply circuit.



Station automation



Each station has the ability to limit its output

As soon as a vehicle is connected, charging can begin, but the output can be automatically limited by the station:

> either to comply with constraints of maximum power of the vehicle charger, the charging cable or the station;

> or upon an order received from the PLC running the EVlink MS Energy Management program.

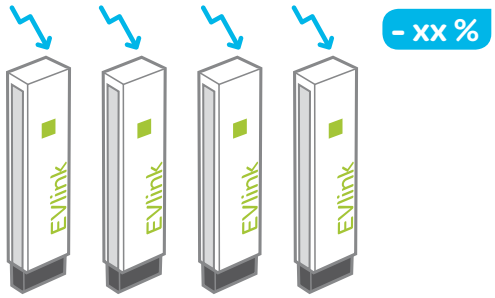
EVlink MS Energy Management limiting scenarios

The PLC performing energy management can at any time reduce the station's power by sending orders to all the stations.
A choice of scenarios is proposed at start-up, making it possible to take into account constraints related to the use of the vehicles coming for charging.

Uniform reduction

The instantaneous output of each station is reduced by an identical percentage.

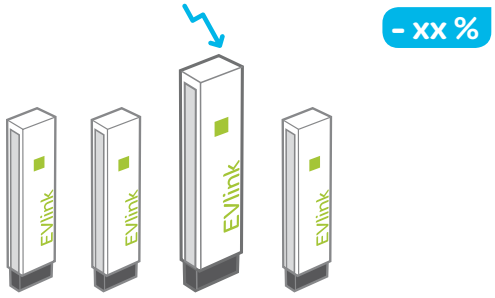
Case of a station with charging stations for vehicles having equal privileges.



Reduction with priorities

The output of the stations of highest power is reduced first.

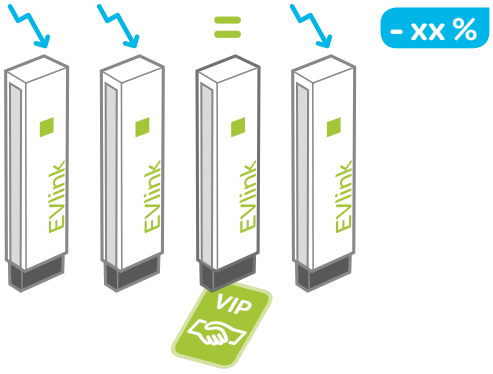
Case of a station where the priority is to provide the same quantity of energy to all vehicles in the event of a reduction in the available power.



Reduction with VIP badge

The station charging a vehicle identified by a priority badge applies the requested reduction only partially or not at all.

Case of a station with badge identification charging stations. Charging of certain vehicles is not penalized for service reasons or to give priority to a customer.



Supervising operation

EVlink MS Supervision
EVlink MS Data Access
(Supervision services via Ethernet)

EVlink MS Supervision

Supervision of charging stations

EVlink Supervision is a secure operating system...

It was designed to allow efficient operation of a fleet or a charging station:

> centralized remote supervision and management

> real-time management

> directly interpretable display of statistics

> more efficient maintenance operations.

... for communicating infrastructure

The website allows operation of an infrastructure consisting of a single station or a number of dispersed stations.

Each station exchanges its data via a wireless modem (GPRS).

The operating status, energy set point values and meter values can be accessed locally via PC and remotely with a mere web browser.

The freedom and security of Cloud Computing

Schneider Electric has adopted Cloud Computing to collect, store and provide data on the communicating stations.

Using Cloud Computing, the necessary IT resources (servers, application programs, etc.) are made available in real time via Internet.

> Access is possible from any location via a standard web browser.

> The station owner is relieved of capital costs and IT administration costs.

> The data is secure, and is backed up automatically.

> The data for all the stations is centralized, and access can be defined by facility, by region or for all installations.

EVlink MS Supervision: advantages for everyone

The management tools are **appropriate**, and also adapted to multi-facility infrastructure

> Complete visibility of the stations. Remote controls, activity reports, consumption balance.

> Maintenance alarms and information.

There is high **reactivity**

in management of user badges and consumption reports.

The cost of maintenance **is reduced,** and it can be planned

The activity data provided enhance:

> customer satisfaction due to an improved understanding of their behaviour

> the quality of action plans and the relevance of reporting;

> the value of analyses to consider infrastructure changes and capital expenditure.

A real "business" and "value added" view is possible, thanks to reports allowing cost calculation and data export to our own information systems and our customer portals.

Trust in the network of charging stations is **enduring:**

> since problems are detected automatically, the availability of the stations is always high;

> updating of badge-related access rights is very fast, and valid simultaneously at all locations.

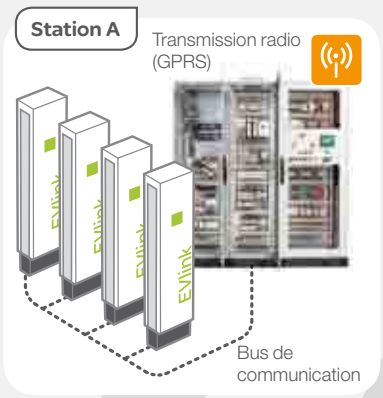
EVlink MS Supervision

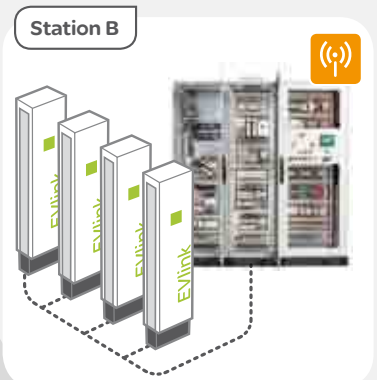
Supervising charging stations without constraints of distance

Each station collects information from communicating stations and energy meter values.

It is connected to the communication networks via a GPRS modem.

Any PC provided with a web browser can obtain access to supervision provided that its user has the necessary rights. The data exchanged is secure.





The data and parameters of all the stations are stored and archived in secure data centres. This information is made available in the form of web pages, files or data flows.

EVlink MS Supervision functionalities

Supervision

Be informed of the situation of the fleet, to react	
On a geographic map	Check off stations and their status: active / faulty
	For each station, read the number of stations Operational - Charging / Total
Be alerted, station by station, to perform fault finding	
On monitoring screen	View electrical alarms
	Know the status of communication with the station
On a log	Consult time-stamped events
Control a station remotely	
Start/stop charging a vehicle	
Restart the modem	

Parameters setup

Consult parameters	
Read max. power thresholds of the station	
Perform servicing on automatic controls	
Display/change operating parameters	

Statistics

Monitor fleet activity	
Overall, by region or profit centre, site by site	
On tables or charts, consult:	No. of charges per station, per hour
	No. of charges per station, per day
	No. of charges per station, per week
	No. of charges per station, per month
	No. of charges per station, per year
On tables or charts, consult:	Total max. station power, per day
	Total max. station power, per week
	Total max. station power, per month
	Total max. station power, per year
On tables or charts, consult:	Cumulative total station consumption, per day
	Cumulative total station consumption, per week
	Cumulative total station consumption, per month
	Cumulative total station consumption, per year
Export statistics to Excel files	

User management

Authorize access via RFID badge
Activate and deactivate badges on lists
Record transactions for each badge
Consult the time-stamped charging log (badge No., kWh)
Export operation reports
Download the file of operations for external processing using standard software (Excel, Access, etc.): sorting by period, by user, creation of spreadsheets, printing, etc.

EVlink MS Supervision

The dashboard for your fleet of stations

For supervision: a clear, customizable dashboard

It covers only the information that is useful each day, grouped by theme in widgets.

A choice of several widgets is displayed simultaneously on the dashboard, while the others can be accessed by scrolling:

> station location and status,

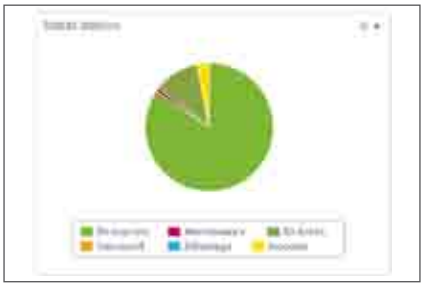
> occupancy for the previous day…

The parameters of each widget allow it to be customized slightly more, by choosing its refresh frequency, for example.

A choice of widgets for relevant monitoring, in real time

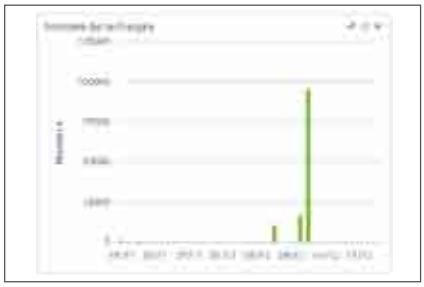
Locating stations and their status

For each station an indicator displays the number of stations operational/inoperational.



Detailed status of the fleet

Percentage of stations in operation, in load shedding, in maintenance, fault mode.



Station occupancy

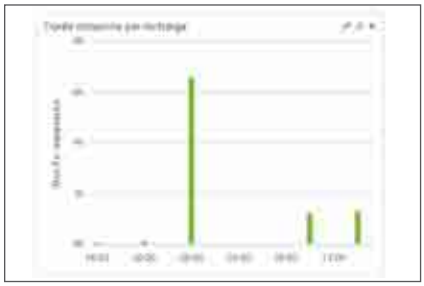
Number of charges for the selected period.

Fleet availability

Percentage of stations available and unavailable, breakdown by length of unavailability.

Occupancy rate

Charging connector occupancy indicators.

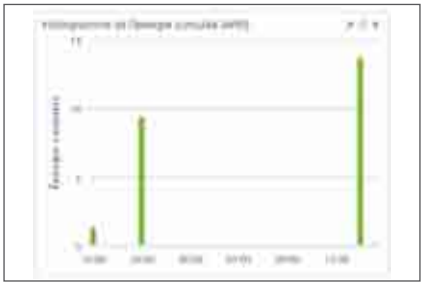


Duration of charges

Change in average duration of charges.

Cumulative energy

consumed by charges since last reset.

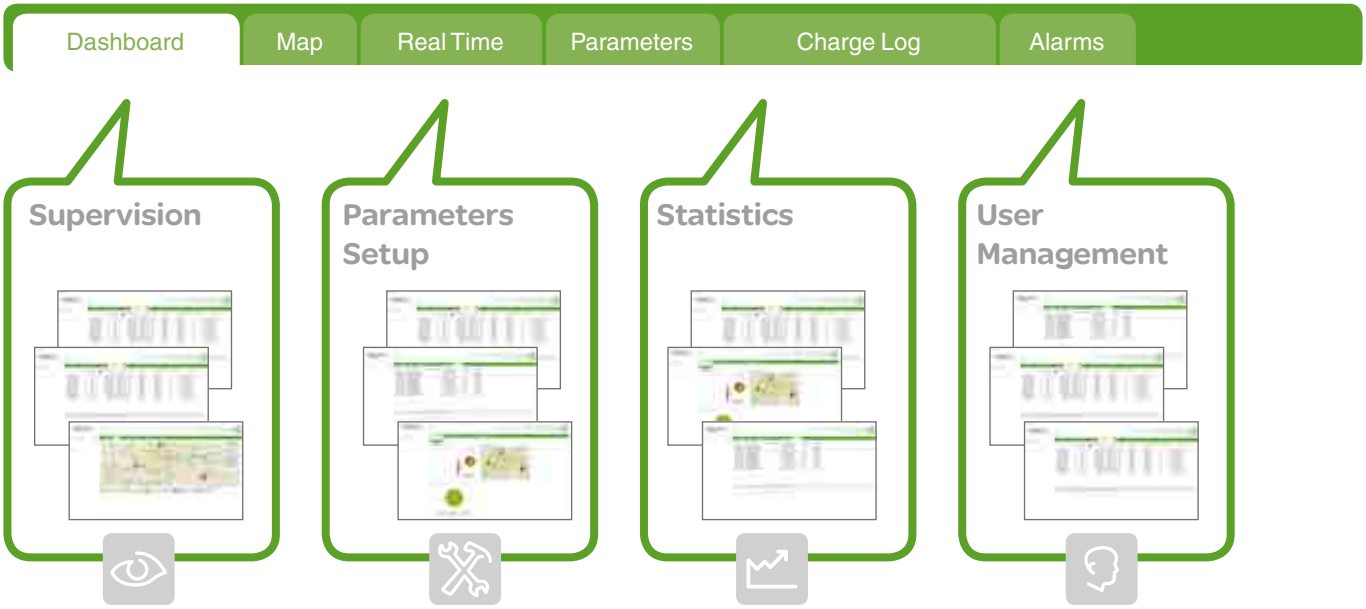


Energy consumed by charges

Breakdown per day, per week, per month or per year.

Navigation via tabs

On the dashboard, tabs give access to four areas of operation.



A specific access according to the user

Identification of the EVlink MS Supervision user is required to protect data and prevent risky operations that could adversely affect operation of the installations.

Tow site access levels are differentiated by password:

> **"Site administrator" access:** allows access to all pages and functions, including user management.

> **"Operator" access:** restricted access to "Supervision", "Statistics" and "Parameters Setup" pages and functions.

EVlink MS Supervision

EVlink MS Supervision subscription

Data collection, access to supervision

By taking out an EVlink MS Supervision subscription it is possible to benefit from supervision services in "hosted" mode.

The subscription covers:

> availability of the server and the EVlink MS Supervision application;

> data collection and storage;

> access to the website via a standard web browser, for configuration and operation;

> GPRS communication.

It does not include the GPRS modem, the SIM card, or internet access. Access to the site is multi-station, multi-user (administrator, Maintenance Department, Sales Department, etc.).

Security, confidentiality

Access to the site is protected by password, and each operator has a personalized access and authorizations for consulting and modifying data.

Data interchange in accordance with the HTTPS protocol ensures data integrity and confidentiality.

Subscription

The subscription is taken out for a period of one to three years, renewable by tacit agreement.

> ***EVlink MS Supervision***
> *Annual subscription*
>
> **Reference: NCA80080**

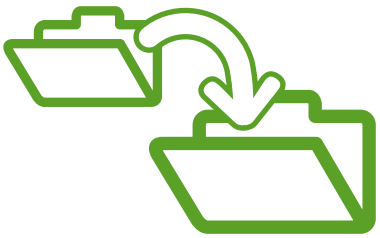
EVlink MS Data Access subscription

"System to System" data delivery:

Interfacing of EVlink MS Supervision with management information systems

Some firms that are concession operators of car parks or operators of a vehicle fleet will want to incorporate operating data from the charging stations in their own information systems.

EVlink MS Data Access is a web service capable of meeting this need.



Subscription to data downloading

The required data and their format are defined in cooperation with the firm's computer application correspondents.

> ***EVlink MS Data Access***
> *Provision of personalized data*
>
> **Reference: Please contact us**

Solutions for your project

"Turnkey" project
Services for designers and installers
Services for operators

Solutions for your project

Listen
Understand
Propose

Your Schneider Electric correspondent is a professional, specialized in the charging infrastructure market.

Based on the technical and economic data of your charging station project, he will propose to you the most appropriate solution:

> "Turnkey" station project performed by Schneider Electric

> Sale of stations and services to qualified professionals with possible support at start-up

> Services, etc.

Preliminary technical audit

It is sometimes necessary to contractualize the solution proposal.

This service is essential when the power of the station could jeopardize the electrical infrastructure of an existing facility.

"Turnkey" project

The charging station project is proposed to you in a contractual document

The following are specified:

> precise characteristics of the structure

> schedule of the various project phases and a delivery date

> technical documents submitted for operation and maintenance

> conditions of support services.

On the agreed date Schneider Electric will deliver a station in operating condition and allowing in-situ training of operating personnel.

The project is entrusted entirely to the Electric Vehicle Centre of Expertise.

A single correspondent for the project team, whatever the subject, commercial or technical.

Energy management and supervision are key to the expertise of project teams

Solutions

> EVlink MS Energy Management

> EVlink MS Supervision Energy

are generally included in "turnkey" projects.

Services for designers and installers

Regulatory aspects, architectures
→ for engineering offices and systems integrators:

Presentation of charging station design rules (safety aspects). Training in standard architectures established by Schneider Electric and components, allowance for profitability and scalability aspects.

Setup, tests, maintenance
→ for installers:

Presentation of charging station components. Training in assembly, operating tests and maintenance procedures. Submission of servicing technical documents.

Services for operators

Technical monitoring:
Constant supervision and diagnosis

Equipped with a permanent link to the data server centre, the station is under the control of Schneider Electric specialist technicians.

If any anomaly is detected, an initial diagnosis is performed. The operator is informed, and can be guided for simple restarting operations.

If necessary, the involvement of a partner firm may also be decided on.

Maintenance:
Preserving availability

Schneider Electric has trained and is training a network of local installer-partners.
They contribute to routine maintenance of your charging stations and perform work if necessary.
They have the support of our Customer Care Centres.

Expert appraisal – advice:
Making the most of your station

Based on the activity and consumption reports our experts establish an efficiency diagnostic of the installation based on energy cost and equipment availability criteria.

If necessary, operating advice and proposals for technical improvement are submitted.

List of references

EVlink Residential stations

Characteristics	References
Stations without attached cable	
3 kW – T3 – INT [1]	**NCA19130**
11 kW – T3 – INT	**NCA19330**
3 kW – T3– FR (supplied with RCCB)	**NCA11130**
7 kW – T3– FR (supplied with RCCB)	**NCA11230**
Stations with attached cable and cable holder	
3 kW – T1 – INT; cable	**NCA11100**
7 kW – T1 – INT; cable	**NCA19200**
7 kW – T2 – INT; cable	**NCA19210**
11 kW – T2 – INT; cable	**NCA19310**
Accessory	
Cable holder, "Residential" design	**NCA00100**

(1) = *Power – Connector type – INT: international market – FR: French market only.*

EVlink Parking stations

Characteristics	References
Stand-mounted stations	
7 kW – 1 x T2 [2]	**EVF1S7P02**
7 kW – 1 x T2 – RFID	**EVF1S7P02R**
7 kW – 1 x T3	**EVF1S7P03**
7 kW – 1 x T3 – RFID	**EVF1S7P03R**
7 kW – 2 x T2	**EVF1S7P22**
7 kW – 2 x T2 – RFID	**EVF1S7P22R**
7 kW – 2 x T3	**EVF1S7P33**
7 kW – 2 x T3 – RFID	**EVF1S7P33R**
22 kW – 1 x T2	**EVF1S22P02**
22 kW – 1 x T2 – RFID	**EVF1S22P02R**
22 kW – 1 x T3	**EVF1S22P03**
22 kW – 1 x T3 – RFID	**EVF1S22P03R**
22 kW – 2 x T2	**EVF1S22P22**
22 kW – 2 x T2 – RFID	**EVF1S22P22R**
22 kW – 2 x T3	**EVF1S22P33**
22 kW – 2 x T3 – RFID	**EVF1S22P33R**
Wall-mounted stations	
7 kW – 1 x T2	**EVW1S7P02**
7 kW – 1 x T2 – RFID	**EVW1S7P02R**
7 kW – 1 x T3	**EVW1S7P03**
7 kW – 1 x T3 – RFID	**EVW1S7P03R**
7 kW – 2 x T2	**EVW1S7P22**
7 kW – 2 x T2 – RFID	**EVW1S7P22R**
7 kW – 2 x T3	**EVW1S7P33**
7 kW – 2 x T3 – RFID	**EVW1S7P33R**
22 kW – 1 x T2	**EVW1S22P02**
22 kW – 1 x T2 – RFID	**EVW1S22P02R**
22 kW – 1 x T3	**EVW1S22P03**
22 kW – 1 x T3 – RFID	**EVW1S22P03R**
22 kW – 2 x T2	**EVW1S22P22**
22 kW – 2 x T2 – RFID	**EVW1S22P22R**
22 kW – 2 x T3	**EVW1S22P33**
22 kW – 2 x T3 – RFID	**EVW1S22P33R**
Accessories	
"Parking" design cable holder	**EVP1PH**
Incoming cable protective cover – for wall-mounted parking lot station	**EVP1WPSC**

(2) = *Power – Number x type of connectors – RFID: badge reader.*

Additional offer

EVlink Management Services components	Reference
EVlink GPRS Modem	**NCA91000**
PLC software	**References**
Energy and Cluster management SD card	**NCA82000**
Cluster management SD card	**NCA84000**
Subscriptions to supervision	**Reference**
Annual subscription fee	**NCA80080**
Charging cable	**Reference**
3 kW – T3-T1 – 5 m [3]	**NCA01353**
Start-up tool	**Reference**
Electric vehicle simulation kit	**NCA93100**

(3) = *Power – Connector types – Length.*

All "Electric vehicle" news on the website

www.schneider-electric.com/electric-vehicle

EVlink – Charging stations for electric vehicles
EV drivers
Professionals
Contractors
EVlink – charging stations for electric vehicles
Electric vehicle charging stations
to fit any location and any vehicle

> Information

> Advice

> Charging solutions…

and much more!

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